

half verified; 2,049, or 20.60 per cent., were three-fourths verified; 4,776, or 48.01 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

#### CAUTIONARY SIGNALS.

During August, 1886, thirty-eight signals of various kinds were ordered, of which number, thirteen, or 34.21 per cent., were fully justified both as to direction and velocity. Of the above signals, seven were ordered for northeasterly winds; of these, four, or 57.14 per cent., were justified both as to direction and velocity, and five, or 71.42 per cent., were justified as to velocity only. Thirty-one signals were ordered for winds without regard to direction; of these, twenty-two, or 70.97 per cent., were not verified, and nine, or 29.03 per cent., were verified.

In twenty-one cases winds occurred which would have justified cautionary signals had they been displayed, and in eleven cases winds occurred which would have justified the display of on-shore signals.

#### RAILWAY WEATHER SIGNALS.

Prof. P. H. Mell, jr., director of the "Alabama Weather Service," in the report for August, 1886, states:

The verification of predictions for the whole area was 92.7 per cent. for temperature, and 75 per cent. for weather.

The following corporations comprise this system: South and North; Montgomery and Mobile; Mobile and Girard; Georgia Pacific; East Tennessee, Virginia and Georgia system in Alabama; Memphis and Charleston; Columbus and Western; Atlanta and West Point of Georgia; Northeastern of Georgia; Western and Atlantic; East Tennessee, Virginia and Georgia system in Georgia; Montgomery and Eufaula; Pensacola and Selma; Pensacola and Atlantic; the cities of Milledgeville, Georgia, and Talladega, Alabama.

#### LOCAL WEATHER SIGNALS.

Prof. Goodwin D. Swezey, director of the "Nebraska Weather Service," in the report for August, 1886, makes the percentage of verifications for temperature in the state 85.0, and weather 71.7.

Prof. Winslow Upton, director of the "New England Meteorological Society," in the report for August, 1886, states:

The verification of weather signals at New Haven was 84 per cent. for temperature, 74 for weather; at fourteen other stations reporting to the secretary, 87.1 for temperature, 79.9 for weather. Predictions at Blue Hill for twenty-four hours from sunset were 81 per cent. verified, and for sixteen hours from 8 a. m. 84 per cent. verified. It should be noted that no rules have been adopted for verifying predictions, and these returns are not strictly comparable.

#### ERRATA.

In the REVIEW for July, 1886, on page 185, under "Precipitation," in the lines "The distribution of rainfall over the United States and Canada for June, 1886," instead of "June" read July. In the same REVIEW on page 190, under "Cotton region reports," in the third line, instead of "June" read July. On page 202, in the "Meteorological record of voluntary observers and Army post surgeons," under Alabama, instead of "Birmingham" read Greensborough.

*Meteorological record of voluntary observers and Army post surgeons, August, 1886.*

The maximum and minimum temperatures at stations marked thus (\*) are from readings of other than standard instruments.

Stations.	Temperature.				Rainfall.	Stations.	Temperature.				Rainfall.
	Maximum.	Minimum.	Mean.				Maximum.	Minimum.	Mean.		
Alabama.	o	o	o	Inches		California—Cont'd.	o	o	o	Inches	
Greensborough.....	94	67	79.0	7.31		Bidwell, Fort.....	96	39	72.5	0.16	
Mount Vernon B'ks. 102	64	64	82.2	6.90		Cahuenga.....	104	38	70.9	0.00	
Arizona.						Gaston, Fort.....	84	54	62.3	0.00	
Huachuca, Fort.....	97	55	75.0	4.24		Hydenville.....	101	52	78.2	0.00	
Lowell, Fort.....	111	67	86.4	1.24		Mason, Fort.....	81	54	61.2	0.00	
McDowell, Fort.....	116	64	92.2	2.04		Nicolaus.....	101	52	78.2	0.00	
Arkansas.						Oakland.....	98	54	74.2	0.02	
Lead Hill.....	109	53	81.0	3.91		Oroville.....	98	54	74.2	0.02	
British Columbia.						Presidio of San F.....	75	47	58.0	0.00	
New Westminster.....	83	49	64.4	1.60		Princeton.....	105	50	76.6	0.00	
California.						Sacramento.....	92	49	72.2	0.00	
Alcatraz Island.....	69	48	55.5	0.00		Salinas.....	78	54	59.6	0.00	
Anderson.....	107	62	80.0	0.00		Santa Barbara.....	85	53	68.2	0.00	
Angel Island.....	84	52	62.1	0.00		Susanville.....	97	68	72.0	0.03	
Benicia Barrack.....	94	55	69.8	0.00							

#### Meteorological record of voluntary observers, etc.—Continued.

Temperature.					Temperature.				
Stations.	Maximum.	Minimum.	Mean.	Rainfall.	Stations.	Maximum.	Minimum.	Mean.	Rainfall.
Colorado.	o	o	o	Inches	Kansas—Cont'd.	o	o	o	Inches
Colorado Springs.....	89	45	68.9	1.39	Wyandotte.....	108	48	71.0	1.30
Lewis, Fort.....	58	39	64.9	3.99	Yates Centre.....	99	49	70.5	3.57
Connecticut.					Kentucky.				
Hartford.....	88	42	68.3	3.33	Bowling Green.....	95	60		
North Colebrook.....	88	35	64.2	1.51	Frankfort.....	92	53	75.4	4.35
Southington.....	90	49	67.9	2.35	Louisiana.				
Dakota.					Grand Coteau.....	95	72	82.0	1.62
Abr. Lincoln, Fort.....	109	32	70.8	1.90	Liberty Hill.....	94	71	87.5	4.31
Meade, Fort.....	103	32	77.9	1.50	Luling.....	94	65	79.9	1.09
Penning, Fort.....	101	34	65.9	0.25	Maine.				
Randall, Fort.....	101	30	75.7	4.25	Bar Harbor.....	90	47		1.44
Richardson.....	106	36	69.8	1.40	Cornish.....	90	49	65.8	4.08
Sisaton, Fort.....	100	29	69.7	1.60	Gardiner.....	87	47	64.7	2.82
Sully, Fort.....	110	39	77.0	1.15	Orono.....	90	43	65.6	2.27
Totten, Fort.....	105	33	69.4	0.89	Maryland.				
Webster.....	106	31	71.8	2.36	Cumberland.....	88	50	70.5	3.25
Yates, Fort.....	106	27	74.1	3.21	Fallston.....	89	54	70.9	4.53
District of Columbia.					Great Falls.....	94	55	74.3	1.03
Distributing Res'r.....	90	58	75.8	1.58	McDonough.....	89	54	74.4	0.83
Receiving Res'r.....	90	61	75.6	1.07	McHenry, Fort.....	85	58	72.3	3.74
Rock Creek Bridge.....	93	60	77.1		Woodstock.....	89	50	71.0	2.21
Florida.					Massachusetts.				
Alva.....	95	70	78.4	9.55	Amherst.....	90	39	66.3	2.60
Archer.....	97	69	81.9	5.50	Amherst b.....	88	50	67.3	2.92
Limona.....	102	72	83.7	8.91	Blue Hill Obs'y.....	88	50	65.4	3.95
Manatee.....	95	75	83.5	11.43	Dudley.....	92	40	70.2	3.04
Meade, Fort.....	92	69	79.9	4.21	Fall River.....	85	46	66.6	4.18
Merritt's Island.....	92	69	79.3	6.70	Fitchburg.....	90	51	67.4	3.15
St. Augustine, Fort.....	94	70		7.75	Heath.....	90	50		
Tallahassee.....	94	70			Milton.....	85	43	64.3	3.29
Georgia.					New Bedford.....	84	48	66.6	2.95
Athens.....	94	60	76.6	2.78	Princeton.....	90	47	65.1	3.18
Forysth.....	98	68	79.7	3.49	Somerset.....	92	47	70.4	3.53
Milledgeville.....	96	62	80.0	5.54	Taunton.....	92	45	67.5	3.81
Idaho.					Westborough.....	95	38	70.0	4.41
Bois Barracks.....	102	50	79.1	trace	Worcester.....	83	51	66.1	3.81
Coeur d'Alene, Fort.....	95	41	67.6	0.04	Michigan.				
Illinois.					Brady, Fort.....	92	36	64.5	1.42
Anna.....	98	51	77.9	2.63	Harrisville.....	91	34		4.33
Bunker Hill.....	94	58	72.2	2.94	Hudson.....	92	36		4.60
Bloomington.....	94	58		1.73	Kalamazoo.....	86	51	68.5	4.67
Collinsville.....	101	51	76.8	3.45	Lansing.....	80	38	68.5	5.70
Charleston.....	102	50	76.1	2.90	Mattville.....	92	50		2.88
Geneseo.....	97	43	75.3	0.83	Pontwater.....	93	32	66.2	4.58
Mattoon.....	102	58	77.0	3.30	Thorntonville.....	92	49	69.9	3.25
Pekin.....	99	47	77.4	5.53	Traverse City.....	95	48		4.20
Peoria.....	99	52	78.8	3.30	Minnesota.				
Riley.....	93	45	69.6	5.85	Minneapolis.....	95	45	70.4	2.33
Rockford.....	90	50	71.0	8.41	Snelling, Fort.....	96	39	72.4	3.13
Sandwich.....	96	52	73.7	3.01	Missouri.				
South Evanson.....	96	44		3.58	Carthage.....	100	53	79.7	3.82
Sycamore.....	96	44	70.2	4.29	Centerville.....	103	43		5.22
Windsor.....	100	48	76.3	3.08	Central College.....	105	50	79.5	3.06
Indian Territory.					Conception.....	100	50	78.1	1.57
Gibson, Fort.....	105	52	80.3	3.00	Pierce City.....	100	52	77.3	3.10
Reno, Fort.....	108	58	83.2	0.34	Warrenton.....	101	60	77.8	
Supply, Fort.....	104	55	79.8	0.92	Montana.				
Indiana.					Assinaboine, Fort.....	97	46	70.2	0.17
Butlerville.....	95	55	75.0	6.00	Ellis, Fort.....	102	34	68.2	1.01
Fort Wayne.....	96	47	72.0	4.41	Keogh, Fort.....	112	36	76.0	0.32
Connersville.....	87	58	70.8	7.43	Missoula, Fort.....	90	44	67.2	0.30
Jeffersonville.....	93	55	75.3	5.10	Shaw, Fort.....	95	35	69.1	0.28
Laconia.....	97	53	75.7	3.35	Nebraska.				
Lafayette.....	97	44	74.0	4.46	Brownville.....	102	53	78.0	2.12
La Grange.....	90	42	70.5	5.70	Crete.....	99	40	75.0	3.24
Logansport.....	98	52	74.4	6.30	De Soto.....	100	49	75.8	2.71
Mauzy.....	88	44	69.2	7.31	Fairbury.....	100			3.49
Speiteland.....	91	48	70.6	6.88	Fremont.....	97	40	74.1	2.77
Sunman.....	90	50	73.8	7.38	Genoa.....	97	43	75.4	3.20
Terre Haute.....	91	60		3.40	Hay Springs.....	98	40	68.9	2.32
Vevay.....	93	55	74.9	3.18	Marquette.....	96			3.73
Iowa.					Niobrara, Fort.....	105	35	75.8	1.82
Bancroft.....	98	34	72.8	1.66	Robinson, Fort.....	103	38	74.3	0.90
Cedar Rapids.....	96	40	78.5	1.70	Sidney, Fort.....	101	38	71.5	1.04
Corydon.....	102	57	79.0	2.10	Tecumseh.....	104	50	83.1	1.01
Des Moines.....	100	42	75.5		Nebraska.				
Fort Madison.....	96	55		6.60	Carson City.....	98	39	72.1	0.00
Independence.....	94	52	73.4	1.12	Hallock, Fort.....	94	40	70.9	0.24
Logan.....	100	48	76.8	0.70	McDermitt, Fort.....	96	49	73.4	2.06
Manchester.....	98	43	75.1	0.20	New Hampshire.				
Monticello.....	99	40	73.5	2.38	Antrim.....				2.15
Muscatine.....	100	47	75.4	2.62	Ashland.....				3.54
Oskaloosa.....	95	58	74.1	1.11	Belmont.....				2.87
Oskaloosa b.....	95	47			Berlin Mills.....	90	34	62.5	3.57
Urbano.....	103	54	75.5	0.53	Bristol.....				3.22
Kansas.					Hanover.....				2.25
Allison.....	108	49	77.5	1.13	Lake Village.....				3.56
Atchison.....	105	54	79.4	1.76	Nashua.....	95	38	67.5	2.71
Bellefonte.....	101			1.64	Wier's Bridge.....				3.54
Emporia.....	102	56	78.8	2.49	Wolfborough.....				3.19
Hay, Fort.....	102	48	75.9	2.41	Woodstock.....				3.87
Independence.....	104	58	78.4	4.25	New Jersey.				
Lawrence.....	105	52	79.0	2.49	Beverly.....	92	56	71.6	2.15
Manhattan.....	105	60	78.8	2.01	Clayton.....	96	51	71.8	2.98
Manhattan b.....	110	49	78.7	2.06	Dover.....	94	42	67.1	3.38
Riley, Fort.....	104	54	79.9	1.38	Egg Harbor City.....	92	43	70.8	5.36
Salina.....	102	60	80.7	4.00	Moorestown.....	93	52	70.1	2.44
Sterling.....	102	58	76.7	4.77	Phillipsburg.....				1.81
Topeka.....	107	54	80.5	3.93	Readington.....	96	60	74.1	
Wellington.....	100	55	78.0	2.06	Roseland.....				1.79
West Leavenworth.....	110	53		1.00	South Orange.....	88	54	68.0	1.10
Westmoreland.....	105	50	79.0	0.75	Upper Montclair.....	88	52	71.0	2.50

## Meteorological record of voluntary observers, etc.—Continued.

Station.	Temperature.			Rainfall.	Station.	Temperature.			Rainfall.
	Maximum.	Minimum.	Mean.			Maximum.	Minimum.	Mean.	
<i>New Jersey—Cont'd.</i>	0	0	0	<i>Inches</i>	<i>Pennsylvania—Con.</i>	0	0	0	<i>Inches</i>
Vineyard.....	90	58	73.0	4.52	Quakertown.....	86	47	67.0	2.79
<i>New Mexico.</i>					Wellsborough *.....	93	48	70.6	1.27
Bayard, Fort.....	93	53	72.7	1.50	West Chester.....	91	53	70.6	1.27
Gallinas Spring.....	89	61	75.0	5.12	Wyox.....	88	47	67.7	1.43
Selden, Fort.....	102	59	79.9	1.05	Zionsville.....	94	64	73.7	0.54
Union, Fort.....	86	41	67.0	8.04	<i>South Carolina.</i>				
Wingate, Fort.....	92	52	67.0	2.96	Aiken.....	94	63	79.8	5.60
<i>New York.</i>					Kirkwood *.....	88	64	75.8	2.38
Auburn.....	87	47	66.1	2.49	Laurens.....	85	67	75.2	7.01
Columbia, Fort.....	89	57	71.8	1.00	Spartanburg.....	81	69	70.4	7.69
Cooperstown *.....	85	48	63.7	2.56	Stateburg *.....	96	66	77.2	2.12
David's Island.....	92	52	72.0	1.27	<i>Tennessee.</i>				
Factoryville *.....	91	48	66.7	1.47	Ashwood.....	98	62	80.0	2.99
Humphrey *.....	86	46	62.3	2.57	Anstett.....	96	64	77.4	6.08
Ithaca.....	92	47	67.0	1.09	Milan.....	103	53	77.4	3.47
Madison Barracks.....	87	46	68.0	3.92	<i>Texas.</i>				
Mountainville.....	92	44	68.4	4.35	Austin *.....	103	73	85.5	6.01
Niagara, Fort.....	90	48	68.8	1.57	Clark, Fort.....	107	60	88.2	1.76
North Volney *.....	93	54	67.9	2.30	Cleburne.....	98	64	86.0	2.09
Palmox *.....	89	50	65.3	2.30	Comfort.....	106	65	84.7	3.74
Palmox *.....	92	52	69.5	4.30	Concho, Fort.....	106	65	84.7	3.74
Penn Yan.....	92	52	67.6	3.97	Corsicana.....	105	70	90.0	2.76
Plattsburg B'ks.....	85	53	69.2	3.00	McIntosh, Fort.....	104	64	84.0	4.04
Setauket.....	94	48	71.9	4.60	New Ulm.....	106	66	88.9	0.38
West Point.....	83	61	69.6	2.32	Ringgold, Fort.....	103	56	77.2	3.43
White Plains.....					Silver Falls.....				
<i>North Carolina.</i>					<i>Vermont.</i>				
Chapel Hill.....	96	55	75.9	9.91	Brattleborough.....	93	42	68.0	3.29
Lenoir.....	88	56	71.8	10.20	Burlington.....	89	48	68.0	3.22
Lincolnton.....	90	61	73.4	5.35	Charlotte.....	91	52	68.0	3.00
Raleigh.....	93	65	78.0	6.90	Lunenburg.....	85	49	64.5	4.70
Holdsville *.....	100	54	76.4	0.00	Newport.....	88	48	65.9	5.00
Statesville *.....	91	60	78.2	5.97	Post Mills *.....	93	46	64.0	2.20
Weldon *.....	95	63	75.7	5.02	Poultney.....	90	42	67.0	3.97
<i>Ohio.</i>					Stratford.....	88	48	68.1	3.20
Cleveland.....	90	49	69.4	2.00	<i>Virginia.</i>				
Clyde.....	92	58	73.9	1.60	Accotink.....	93	58	73.5	2.28
College Hill *.....	103	57	75.9	5.12	Bird's Nest *.....	93	66	78.1	6.20
Elyria.....	91	51	71.2	2.25	Bruntington.....	95	57	76.4	3.55
Garrettsville.....	93	39	66.2	2.74	Dale Enterprise *.....	95	57	76.4	5.85
Jacksonborough *.....	96	52	72.5	4.60	Marion.....	85	57	70.0	6.09
Napoleon.....	92	48	71.3	3.61	Monroe, Fort.....	92	62	75.9	6.33
North Lewisburg.....	94	51	73.0	4.55	Rappahannock St'n.....	68	51	75.7	1.44
Portsmouth.....	88	54	71.8	3.98	Snowville.....	85	53	68.0	4.70
Ruggles *.....	90	48	66.0	2.70	Summit.....	95	48	72.7	3.55
Timb *.....	93	49	69.4	1.83	University of Va.....	83	66	72.0	1.74
Timb *.....	93	53	70.4	1.96	Variety Mills.....	93	54	72.0	2.88
West Milton.....	98	52	75.0	7.75	Wytheville.....	84	46	69.3	4.78
Wauseon.....	95	43	69.5	4.86	<i>Washington Territory.</i>				
Westerville.....	68	45	70.0	2.51	Bainbridge Island *.....	87	46	66.0	0.35
Yellow Springs.....	87	48	69.6	4.67	Konowick.....	107	46	66.0	trace
<i>Oregon.</i>					Tacoma *.....	82	52	65.8	0.44
Albany *.....	95	53	68.5	trace.	Townsend, Fort.....	82	47	62.6	0.23
Bandon *.....	71	40	54.4	0.19	Walla Walla, Fort.....	102	52	76.5	0.16
Eola *.....	87	56	65.7	0.00	<i>West Virginia.</i>				
East Portland *.....	88	50	66.0	0.00	Clarksburg.....	88	49	73.6	1.59
Klamath, Fort.....	94	29	61.8	0.02	Helvetia *.....	88	45	67.0	3.77
La Grande.....	97	53	69.0	0.11	Parkersburg.....	89	50	72.0	2.52
Mount Angel *.....	90	54	68.2	0.00	<i>Wisconsin.</i>				
<i>Pennsylvania.</i>					Delavan.....	90	45	69.2	7.40
Blooming Grove *.....	96	50	67.6	5.20	Embaras *.....	92	46	69.0	7.00
Bethlehem *.....	93	55	72.5	2.15	Fond du Lac *.....	94	35	69.4	3.77
Catawissa *.....	91	50	70.5	1.59	Madison.....	94	47	73.1	5.05
Daberry.....	90	42	64.5	1.98	Manitowoc.....	92	45	68.4	1.37
Drifton.....	91	45	63.8	1.82	Prairie du Chien.....	96	47	73.4	2.82
Easton.....					Wausau.....	90	39	66.2	4.47
Franklin *.....	86	40	61.9	1.62	<i>Wyoming.</i>				
Germantown *.....	94	56	72.0	1.86	Laramie, Fort.....	100	42	72.4	1.06
Grampan Hills *.....	90	52	68.0	2.92	McKinney, Fort.....	101	43	71.6	0.40
Mahanoy Plane.....	94	61	76.5	1.63	Washakie, Fort.....	99	40	72.0	0.00
Phillipsburg *.....	89	45	63.0	3.09					

## NOTES AND EXTRACTS.

The following is an extract from the August, 1886, report of the "Alabama Weather Service," under direction of Prof. P. H. Mell, jr., of the Agricultural and Mechanical College, Auburn:

During the month of August the temperature has been slightly (1°.5) below the normal. The average temperature of the month is the same as that given in the July bulletin. The middle of August was quite warm for several days, and then the temperature began to fall, making the close of the month cool and pleasant.

The precipitation was also but little below the normal (0.40 of an inch) and the rains were favorably distributed throughout the month. The northern part of the state was less fortunate in the quantity of rain that fell than middle and southern Alabama. The last two sections received fully 1.72 inches more rain than the first.

During most of the month the crops were in excellent condition, every indication pointing to a handsome yield from the cotton fields. The last week, however, the cotton plant suffered in some degree, and there has been a slight falling off from the earlier indications. Nevertheless, the reports from all sections of the state pronounce the crop an excellent average yield for August.

## State summary.

**Temperature.**—Mean temperature, 79°; highest temperature, 103°, at Birmingham, on the 18th; lowest temperature, 41°.8, at Chattanooga, on the 7th; range of temperature, 61°.2; greatest monthly range of temperature, 46°, at Gadsden; least monthly range of temperature, 21°, at Selma University; mean daily range, 13°.8; greatest daily range of temperature, 35°, at Gadsden, on the 11th; least daily range of temperature, 0°, at Valley Head, on the 24th.

**Rainfall.**—Mean depth of rainfall, 3.84 inches; mean daily rainfall, 0.164 inches; greatest depth of monthly rainfall, 1.32 inches, at Newton; least depth of monthly rainfall, 1.23 inches, at Bermuda; greatest daily rainfall average for state, 0.65 inches, on the 2d; greatest daily local rainfall, 4.00 inches, at Newton, on the 30th.

Average number of days on which rain fell, 9.7; average number of cloudy days, 9; average number of fair days, 14; average number of clear days, 8.

Warmest day, 16th; coldest day, 31st.

Prevailing direction of wind, southeast.

The following meteorological summary, for August, 1886, is from the Georgia "Crop Report," prepared by Hon. J. T. Henderson, Commissioner of Agriculture for Georgia:

Districts.	Temperature.			Average precipitation.
	Mean maximum.	Mean minimum.	Mean.	
Northern Georgia.....	92.0	63.0	69.7	3.68
Middle Georgia.....	95.0	64.0	79.9	3.80
Southwestern Georgia.....	95.0	69.0	80.7	5.60
Eastern Georgia.....	94.0	66.0	79.5	3.50
Southeastern Georgia.....	93.0	70.0	81.6	5.34
Means for state.....	94.0	66.0	78.3	4.38

The following meteorological summary and accompanying remarks are from the August, 1886, report of the "Indiana Weather Service," under direction of Prof. H. A. Huston, of Purdue University, Lafayette:

Districts.	Temperature.			Average precipitation.
	Highest.	Lowest.	Monthly means.	
Northern counties.....	98.0	47.0	72.0	5.31
Central counties.....	97.0	44.0	72.1	6.12
Southern counties.....	102.0	51.0	74.6	4.58
State.....	102.0	44.0	72.9	5.34

The mean temperature of the state for August, 1886, was 1°.7 above the mean of August for the past four years; 0°.5 below the mean of sixteen years at Indianapolis; 0°.2 above the mean of thirty-one years at Logansport; 3°.0 below the mean of twenty-one years at Vevay; 1°.4 above the mean of thirty-two years at Spiceland; 3°.2 above the mean of seven years at Maury; 2°.1 below the mean of nine years at Blue Lick; 1°.8 above the mean of five years at Worthington; 2°.4 above the mean of five years at Connersville; 0°.2 above the mean of seven years at Lafayette; and about 2°.0 below the normal temperature of the month. The mean temperatures at various stations range from 3°.2 above the average (Worthington) to 1° below the average (Vevay).

The precipitation at all stations was above the average, the excess ranging from 0.04 inches at Vevay to 4.29 inches at Maury.

The following meteorological summary and accompanying remarks are from the August, 1886, report of the "Indiana Weather Service," under direction of Prof. W. H. Ragan, of De Pauw University, Greencastle:

Districts.	Temperature.			Average precipitation.	Summer.	
	Highest.	Lowest.	Monthly means.		Mean temperature.	Precipitation.
Northern counties.....	96.0	42.0	72.1	5.54	71.5	12.04
Central counties.....	97.0	44.0	71.9	6.70	71.8	14.78
Southern counties.....	102.0	50.0	74.8	4.89	73.8	14.26
State.....	102.0	42.0	72.9	5.71	72.4	13.69

The temperature generally averaged a little below normal for both month and season. The precipitation was above normal for both month and season, generally. Connersville reports tornado on the 22d, north of town; destroyed trees through a forest; track about two hundred feet wide; broke trees off mostly ten to twenty feet above ground; no lightning; heavy rain after.

The following is from an advance sheet of the "Iowa Weather Bulletin," for August, 1886, prepared under direction of Gustavus Hinrichs, M. D., Iowa City:

August, 1886, was hot, fair, and generally dry, with a few intense storms; southerly winds and calms prevailing.

The mean temperature of the air was over four degrees above normal, being the hottest on record for over twenty-five years, excepting August 1881, which was one degree warmer. The first decade was normal; the second and third were six degrees above normal. The number of hot days, on which the temperature reached or exceeded 86° was twenty-one, which is the highest ever recorded, being three in excess of August, 1881.

The temperature remained high until the last two days of the month, when the night temperatures ran down low into the forties. On account of the clear sky a light hoar frost covered most of northern Iowa early on the 30th. A more severe hoar frost reached down to Rock Island on the morning of the 31st.

Rainfall was nearly normal in frequency, but very unevenly distributed in amount. The greater part of the state, forming a broad belt about two hundred miles wide, and running from southwest to northeast, received less than two inches of rain. In the northern-middle part of this territory less than one inch fell. Thus the northeast and southwest were dry, as well as the centre of the state.

The following is an extract from the August, 1886, report of the "Missouri Weather Service," under direction of Prof. Francis E. Nipher, Washington University, Saint Louis:

*Temperature.*—The mean temperature for the past month was 3° above the normal for August at the central station. The lowest temperature observed during the month was 57° on the 31st, the only day during the month that the temperature fell below 65°, and on eight days it did not fall below 75°. The highest temperature occurred on the 16th, when the thermometer registered 103°. This is, excepting August 9th and 11th, 1881, when it was 104° and 105°, respectively, the highest temperature observed at Saint Louis during August since 1837. The temperature rose above 90° on twelve days during the month.

*Precipitation.*—The rainfall at the central station was 2.60 inches, which is 1.44 inches below the normal for August.

In the state the highest temperatures reported range from 100° at Ironton to 109° at Pro Tem. The lowest temperatures range from 44° at Ironton to 62° at Pleasant Hill, and were observed on the 31st all over the state.

The rainfall was over five inches in the northeast part of the state, while in the northwest and central parts only a little over one inch fell, and towards the southwest it was over three inches.

The following is from the August, 1886, report of the "Nebraska Weather Service," under direction of Prof. Goodwin D. Swezey, of Doane College, Crete:

The weather for August has presented no striking peculiarities, unless it be the occurrence of a decidedly cool wave at the very close of the month; the mean temperature has been slightly above the average for August, and the highest temperatures of the month have also been above those of August commonly, having been exceeded only once in eight years, viz., in 1881. But on the morning of the 29th a cool wave appeared in the Northwest, and moved in a southeasterly direction, causing a decided fall in temperature in all directions on the 30th and 31st. During its passage frosts were reported in Dakota, Minnesota, Wisconsin, and Nebraska, and killing frost in southern Dakota. The frost was very slight in Nebraska.

The precipitation has not shown the great deficiency that has prevailed for the past few months, being but slightly below the normal for the month over the state generally, while in certain districts in the central part of the state it has been large, the greatest rainfall being 9.5 inches at Minden.

The following is an extract from the August, 1886, "Bulletin of the New England Meteorological Society," under direction of Prof. Winslow Upton, Providence, Rhode Island:

Reports for the month were received from one hundred and fifty observers.

*General Conditions.*—The month was characterized by an abundance of fair weather, with a moderate supply of rain and a small number of thunder-storms. The temperature was below the average and there was an absence of destructive winds. The meteorological history of the month, which presents features varying in no essential respect from those usually found in August, can best be given by describing the course of the barometric pressure. A well-developed depression, passing far north of New England on the 1st and 2d, was attended by general rains and a few thunder squalls. The pressure rose to the normal and remained nearly stationary until the 9th and 10th, when it rose above the average. This period was pleasant, with the exception of slight showers on the 5th and 7th. Two depressions passed north of the district on the 11th and 13th, the second being well marked. Thunder showers, with copious rains, occurred in connection with their passage. On the 16th a cyclonic depression, with pressure at the centre 29.6 inches, moved easterly directly across southern New Hampshire and Vermont, attended by heavy general rains. After its passage the pressure rose rapidly and remained above the average until the 22d, when it fell under the influence of a severe cyclone from the West Indies, which had been felt in the Gulf of Mexico on the 20th and probably advanced northeasterly in the Atlantic Ocean; it was too far from the shore, however,

to materially affect the weather conditions in New England. The pressure was not far from the normal until the 30th, when a depression approached from the Lakes and on the 31st moved down the Saint Lawrence Valley; rains, with some thunder and lightning, were experienced. It will be noted that the barometric depressions enumerated above moved in the usual path, easterly from the Lakes, all passing north of the boundary of New England, except one which moved directly over the district. The cyclones which at this season of the year may be expected from the South are represented by the severe cyclone which was nearest to the coast on the 22d, but whose path lay in the ocean.

The following is from the August, 1886, report of the "Ohio Meteorological Bureau," under direction of Prof. B. F. Thomas, of the Ohio State University, Columbus:

The mean temperature was 70° 9, which is 0° 6 above the four-year mean, but 1° 3 below the normal for the state, as given in our first annual report. The highest temperature recorded was 95°, on the 11th. The lowest was 43°, on the 3d and 4th. These extremes are both within the records for the preceding three years, giving a total temperature range of 52°, which is 6° lower than in 1885, and 7° lower than the average for 1883, 1884, and 1885. The mean daily range of temperature was likewise low, being 20° 6, while the four-year mean was 21° 8.

The number of cloudy and rainy days was greater than usual. The mean rainfall, 3.62 inches, is .3 inch above the four-year average, but .14 inch below the normal. The greatest rainfall was reported from Greenville, 8.72 inches, and the least, 1.36 inches, from Cleveland.

General rains occurred on the 1st, 11th, 13th, 14th, 16th, 22d, 23d, and 30th. Local rains occurred on the 5th, 10th, 12th, 15th, 17th, 28th, and 29th. The rains of the 5th, 10th, and 28th were confined almost entirely to the northern section of the state, and those of the 12th, 15th, and 17th were reported only from the middle and southern sections. The greatest mean rainfall for the month was recorded in the middle section, and the least in the northern.

The following is an extract from the "Tennessee State Board of Health Bulletin," for August, 1886, prepared under the direction of J. D. Plunkett, M. D., President of the State Board of Health. The weather report is prepared by Major H. C. Bate, in charge of the State Meteorological Service:

The special features for August were the high temperatures on the 16th and 17th; the abnormal rainfall in some portions of the state, and the earthquake of the night of the 31st. The other meteorological conditions showed very little, if any, departures from the normal.

The mean temperature was 75° 6, which was about the same as that of the corresponding period of last year, and respectively two and three degrees above that for the same month in 1884 and 1883. The highest temperature was 103°, recorded on the 17th, and was one degree above the maximum recorded last year, which was the highest point reached since the establishment of the State Weather Service; the next highest recorded during the month was 101°, on the same date. The lowest temperature was 52°, and was recorded on the 31st. This was two degrees above the minimum of August, of last year; four degrees above that of August, 1884, and nine degrees above that of August, 1883. During the first decade of the month there was a period of low temperature ending with the 9th.

The mean precipitation was 4.05 inches, 1.75 inches above the mean of August of last year, and nearly 2 inches above that of August, 1884. Of this amount the eastern division received an average of nearly 4½ inches, the middle division received nearly 3½ inches, and the western division about 4 inches. The greatest rainfall was 8.28 inches, reported at Riddleton, and was the greatest for the month of August of any of the preceding years recorded by the State Weather Service; the next greatest being in 1883, when 6.38 inches were recorded. The smallest monthly rainfall was 1.33 inches, reported at Sailor's Rest, on the lower Cumberland, which station reported next to the smallest amount in July. The greatest local daily rainfall was 2.60 inches, reported on the 1st at Covington. A daily rainfall of 2.18 inches was reported at Memphis on the same day. On the 30th Riddleton reported a fall of 2.55 inches, and Hohenwald a fall of 2.18 inches.

#### State summary.

Mean temperature, 75° 6; highest temperature, 103°, on the 17th, at Milan; lowest temperature, 52°, on the 31st, at Fostoria and Trenton; range of temperature, 51°; mean monthly range of temperature, 35° 9; greatest monthly range of temperature, 50°, at Milan; least monthly range of temperature, 26°, at Greenville; mean daily range of temperature, 11° 8; greatest daily range of temperature, 34°, on the 9th, at Hohenwald; least daily range of temperature, 2°, on the 1st at Howell, on the 5th at Greenville and Careyville, on the 25th at Hurricane Switch, and on the 30th at Riddleton; mean of maximum temperatures, 80° 9; mean of minimum temperatures, 59° 3.

Mean depth of rainfall, 4.05 inches; mean daily rainfall, 0.131 inch; greatest rainfall, 8.28 inches, at Riddleton; least rainfall, 1.33 inches, at Sailor's Rest; greatest local daily rainfall, 2.60 inches, on the 1st at Covington; days of greatest rainfall, 1st, 2d, 6th, 23d, 24th, 29th, 30th; day of greatest rainfall, 1st. Average number of days on which rain fell, 10; average number of clear days, 10.3; average number of fair days, 13.9; average number of cloudy days, 6.8. Days without rainfall, 3d, 8th, 9th, 10th; warmest days, 16th, 17th; coldest day, 31st.

Prevailing wind, west.